

YOLO-SOLANO AIR QUALITY MANAGEMENT DISTRICT

1947 Galileo Court, Suite 103; Davis, CA 95618

Phone (530) 757-3650 Fax (530) 757-3670

FACILITY NUMBER: 00257

SIC CODE: 4911

AUTHORITY TO CONSTRUCT

C-09-124

IS HEREBY GRANTED TO

WOODLAND BIOMASS POWER LTD.

P.O. Box 1560

Woodland, CA 95776

EQUIPMENT LOCATION: 1786 Kentucky Avenue; Woodland, CA

TO CONSTRUCT

PROCESS DESCRIPTION: 30 MW power production facility burning biomass and supplemental fuel; modification of P-105-90(t) to add creosote-treated railroad ties as an acceptable biomass fuel

EQUIPMENT INVENTORY: 330 MMBtu/hr Gotaverken circulating fluidized bed boiler (Model No. 722-118), total air fan (700 hp), primary air fan (400 hp), seal air blower (2 at 150 hp each), recirculating air fan (60 hp), induced draft fan (1250 hp)

- Total Billing: Schedule 2, 330 MMBtu/hr -

CONTROL EQUIPMENT INVENTORY:

Baghouse: 6-cell, 342 bags/cell, 6" D x 168" L (each), 156,500 acfm;
Thermal De-NOx system: 20,000 gallon NH3 tank, variable flow;
Limestone injection for SOx control

PERMITTED EMISSION LIMITS:

Pollutant	Daily [lb]	Qtr #1 (Jan 1-Mar 31) [lb]	Qtr #2 (Apr 1-June 30) [lb]	Qtr #3 (July 1-Sept 30) [lb]	Qtr #4 (Oct 1-Dec 31) [lb]	Yearly [Tons]
VOC	420.0	37,800	38,220	38,640	38,640	65.60
CO	1,188.0	106,920	108,108	109,296	109,296	185.60
NOx	631.2	56,808	57,439	58,070	58,070	98.60
SOx	316.8	28,512	28,829	29,146	29,146	49.50
PM10	172.8	15,552	15,725	15,898	15,898	27.00

PERMITTED PROCESS LIMITS:

	Daily [lb]	Qtr #1 (Jan 1-Mar 31) [lb]	Qtr #2 (Apr 1-June 30) [lb]	Qtr #3 (July 1-Sept 30) [lb]	Qtr #4 (Oct 1-Dec 31) [lb]	Yearly [lbs]
VOC	420.0	37,800	38,220	38,640	38,640	131,200
CO	1,188.0	106,920	108,108	109,296	109,296	371,200
NOx	631.2	56,808	57,439	58,070	58,070	197,200
SOx	316.8	28,512	28,829	29,146	29,146	99,000
PM10	172.8	15,552	15,725	15,898	15,898	54,000

The following information is included to inform and assist the Permit Holder in achieving compliance with applicable provisions of Federal, State, and District Rules and Regulations. The following set of referenced regulations are not intended to be either comprehensive or exclusive, nor are they intended to be emission limiting permit conditions, but they are still applicable rules of the District. Occasionally laws are amended. The amended versions of the referenced rules shall be deemed to be in effect. **It is the Permit Holder's responsibility to comply with all applicable Rules and Regulations.** Permit holder shall hold harmless and defend the District, its Board members, Hearing Board members, APCO, officers, agents, employees, and representatives from liability for any award, damages, costs, and fees incurred by the District and/or awarded to any plaintiff in an action challenging the validity of this permit or any environmental or other documentation related to approval of this permit.

1. After construction of all listed process and control equipment is complete, as determined by the District, the ATC Holder shall have 45 calendar days to conduct tests and perform other necessary initial adjustments on the equipment. During this time, this Authority to Construct and its conditions shall function as a temporary Permit to Operate. Any operation of the equipment beyond this period without either District receipt of a valid Permit to Operate Notification Card or written extension from the District, will be considered operation without a permit and subject to enforcement action. The ATC Holder shall provide the District, in writing, a notice prior to commencing the 45-day start-up period. [District Rule 3.1, §402]
2. The District requires an inspection of the equipment after completion of the construction and prior to the issuance of the Permit to Operate. [District Rule 3.1, §402]
3. An authorization to construct shall remain in effect only until the application for Permit to Operate is granted or denied; however, such an authorization shall not remain in effect beyond two years from the date of issuance unless the District finds that the time required for construction requires an extension and grants one or more extensions, for a total time not to exceed five years from the date of issuance. [District Rule 3.1, §407]

The following set of conditions are established by the District to provide enforceable operating parameters as authorized by California Health and Safety Code Section 42301

and District Rule 3.1, Section 402. If any of the rules and regulations referenced below are amended subsequent to the issuance date of this permit, resulting in the amended rule differing from or superseding the corresponding condition, then the Permit Holder shall be required to comply with the amended rule or regulation and shall no longer be required to comply with the superseded condition.

4. The boiler shall only be fired on biomass fuels or supplemental fuel. Biomass fuels shall be limited to: [District Rule 3.4, Section 409.1]
 - a. Sawmill residue;
 - b. Forest residue;
 - c. Urban wood (defined as clean, chipped material derived from construction and demolition materials, pallets, crates, boxes, and tree trimmings). This fuel shall not contain pressure treated wood (except as listed in section e. below) and shall not contain compounds listed in CCR 66261.24(a)(2)(A) in amounts exceeding the TTLTC values;
 - d. Agricultural residues (defined as organic plant-based material generated by agricultural operations). Agricultural residues include but are not limited to: grasses, reject seed, corn cobs; orchard and vineyard prunings (including from orchard removals); prune, peach and olive pits; coffee and cocoa beans; almond shells and hulls; walnut shells; and rice hulls; or
 - e. Railroad Ties (only creosote treated). This fuel shall comply with the provisions of CCR 66261.24.
5. _____ The creosote treated railroad ties shall not exceed 25% (by weight) of the total biomass fuel burned at any time. [District Rule 3.4]
6. Natural gas shall be the only supplemental fuel. The use of natural gas shall be limited to 250 MMBtu/hr. Offset credits shall be used for any emissions generated by the combustion of natural gas. [District Rule 3.4, Section 409.1]
7. For in-stack opacity purposes, except during periods of startup, shutdown, and malfunction, the source shall not cause to be discharged into the atmosphere any gases that exhibit greater than 20% opacity (6-minute average), except for one 6-minute period per hour of not more than 27% opacity. [40 CFR 60.43b(f) and (g)]
8. For visible opacity purposes, the Permit Holder shall not discharge into the atmosphere from any single source of emission whatsoever, any air contaminant for a period or periods aggregating more than three (3) minutes in any one (1) hour which is:
 - a. As dark or darker in shade than No. 1 on the Ringelmann Chart; or
 - b. Greater than 20% opacity. [District Rule 2.3]
9. A curing startup shall not exceed 96 hours in duration and a non-curing startup shall not exceed 24 hours in duration. [District Rule 3.4]
10. A gauge shall be maintained to indicate the differential pressure across the baghouse bags. The baghouse bags shall be cleaned or replaced before the differential pressure reaches the critical pressure, as determined by the manufacturer of the bags. [District Rule 3.4]
11. The permit holder shall calibrate, maintain, and operate a continuous emission monitoring system (CEMS) for O₂, CO, SO₂, NO_x, Opacity, and Volumetric Flow. [District Rule 3.4]

12. A quality assurance/quality control (QC) program for the CEMS shall be maintained. As a minimum, the QC program must include written procedures which should describe in detail, complete, step-by-step procedures and operations for each of the following activities: [District Rule 3.4]
 - a. Calibrations of CEMS;
 - b. Calibration Drift (CD) determination and adjustment of CEMS;
 - c. Preventive Maintenance of CEMS (including spare parts inventory);
 - d. Data recording, calculations, and reporting procedures;
 - e. Accuracy audit procedures including sampling and analysis methods; and
 - f. Program for corrective action for malfunctioning CEMS.

13. The permit holder shall operate the fluidized bed combustion system in a manner such that the exhaust stack emissions are less than the PERMITTED EMISSION LIMITS (daily, quarterly and annual), as determined by the CEMS. [District Rule 3.4, Section 409.1]

14. Except during periods of start-up or shut-down, the permit holder shall operate the fluidized bed combustion system in a manner such that the exhaust stack emissions are less than the following values, as determined by the average value of three one-hour source tests and based upon the measured heat input during the source tests: [District Rule 3.4, Section 409.1]

VOC (as methane)	0.05 lb/MMBtu;
CO	0.15 lb/MMBtu;
NO _x (as NO ₂)	0.08 lb/MMBtu;
SO _x (as SO ₂)	0.04 lb/MMBtu;
PM ₁₀ (front and back half)	0.010 gr/dscf (referenced to 12% CO ₂);
PM ₁₀ (front half)	0.007 gr/dscf (referenced to 12% CO ₂); and
Ammonia slip	50 parts per million by volume dry (ppmvd).

15. Except during periods of start-up or shut-down, the permit holder shall operate the fluidized bed combustion system in a manner such that the exhaust stack emissions are less than the following values, as determined by the average value of three one-hour source tests: [District Rule 3.4, Section 409.1]

VOC (as methane)	17.5 lb/hr;
CO	49.5 lb/hr;
NO _x (as NO ₂)	26.3 lb/hr;
SO _x (as SO ₂)	13.2 lb/hr;
PM ₁₀ (front and back half)	7.2 lb/hr; and
PM ₁₀ (front half)	5.0 lb/hr.

16. During periods of startup, shutdown, and malfunction, the permit holder shall operate the fluidized bed combustion system in a manner such that the exhaust stack emissions are less than the following values, as determined by the CEMS system: [40 CFR 60.44b(d)]

NO _x (as NO ₂)	0.30 lb/MMBtu (30 day rolling average)
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17. The permit holder shall fully offset all actual VOC emissions from this permit unit and shall fully offset all actual PM₁₀ emissions from the entire facility, on a calendar quarter basis, by diverting qualified agricultural biomass from being burned in the field. [District Rule 3.4]

18. The permit holder shall obtain all qualified agricultural biomass material (offset material) from open field burning in the following priorities: [District Rule 3.4]

- a. within 15 miles of the facility;
 - b. within the Yolo-Solano AQMD; and
 - c. from counties within the Sacramento Air Basin.
19. The amount of VOC and PM10 credits (calculated separately) required from the boiler are calculated as follows: [District Rule 3.4, Section 409.1]

$$E = (Sa/Sp) * h * ER$$
where E = emission credits required
Sa = hourly average recorded steam flow for the calendar quarter
Sp = hourly maximum steam production as determined during source testing, or 255,000 lbs/hour, whichever is less
h = hours of operation for the calendar quarter
ER = emission rate (lb/hour - average of three runs) at maximum boiler firing rate from most recent source test
20. The amount of VOC and PM10 credits (calculated separately) generated are calculated as follows: [District Rule 3.4, Section 409.1]

$$EC = \text{Summation } [1/DFi * Ai * EFi]$$
where EC = emission credits generated in pounds per calendar quarter
DFi = distance factor
Ai = amount of each type of qualified agricultural biomass material, in tons per quarter (field condition)
EFi = emission factor, in pounds of pollutant (P) per ton of qualified agricultural biomass material (in field condition moisture) open burned
21. The Distance Factor (DF) shall be 1.2 for agricultural waste diverted from open burning within a 15 mile radius of the source claiming offsets, and 2.0 for agricultural waste diverted from open burning 15 miles or more from the source claiming offsets. [District Rule 3.4]
22. The Emission Factors (EF) are as follows: [District Rule 3.4, Section 409.1]

Fuel type	Emission Factor* (lb/ton)	
	VOC	PM10
Rice straw	4.7	6.3
Wheat straw	7.6	10.6
Almond prunings	5.2	7.0
Apricot prunings	4.6	5.9
Cherry prunings	6.0	7.9
Grape prunings	3.8	4.9
Peach prunings	3.0	5.9
Pear prunings	5.1	8.8
Prune prunings	4.6	2.9
Walnut prunings	4.8	4.2

Other prunings	6.3	7.8
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*Given in field condition moisture

23. The permit holder shall install and maintain such facilities as are necessary for sampling and testing purposes. The number, size, and location of sampling ports shall be in accordance with Air Resources Board Test Method 1 or EPA Test Methods. The location and access to the sampling platform shall be in accordance with the General Industry Safety Orders of the State of California. [District Rule 3.4]
24. The permit holder shall perform an initial source test to determine compliance with the Toxic Air contaminant emission limitations approved by the District. [District Rule 3.4]
25. Toxic Air Contaminant emission rates from the boiler shall not exceed the amounts approved by the District for this permit. [District Rule 3.4]
26. Source testing for Toxic Air Contaminants shall be conducted using the test methods approved by the District. [District Rule 3.4]
27. The permit holder shall perform a source test at least once every 12 consecutive calendar months in order to demonstrate compliance with the following. The District reserves the right to require the permit holder to demonstrate compliance with additional parameters in order to address or ascertain compliance with the requirements of this permit. [District Rule 3.4]:
 - a. VOC concentration (lb/MMBtu) and emission rate (lb/hour);
 - b. CO concentration (lb/MMBtu) and emission rate (lb/hour);
 - c. NOx concentration (lb/MMBtu) and emission rate (lb/hour);
 - d. SOx concentration (lb/MMBtu) and emission rate (lb/hour);
 - e. PM10 (front and back half) concentration (gr/dscf) and emission rate (lb/hour);
 - f. PM10 (front half) concentration (gr/dscf) and emission rate (lb/hour);
 - g. NH3 concentration (ppmvd);
 - h. Oxygen and Carbon Dioxide concentration (%);
 - i. Exhaust stack gas flow rate (dscfm);
 - j. Measured heat input rate (MMBtu/hr); and
 - k. The higher heating value (dry basis) of the biomass fuel.
28. Source testing shall be conducted using the following test methods. Alternative test methods may be used if approved in advance by the District. [District Rule 3.4]
 - a. VOC - EPA method 18, 25, or 25A,
 - b. CO - EPA method 10,
 - c. NOx (as NO2) - EPA method 7E,
 - d. SOx (as SO2) - EPA method 6,
 - e. PM10 (front and back half, adjusted for ammonia salts) - EPA method 5 with impinger analysis and South Coast AQMD Method 5.2,
 - f. Stack gas oxygen and carbon dioxide - EPA method 3 or 3A,
 - g. Flow rate - EPA methods 1 through 4,
 - h. NH3 - Bay Area Air Quality Management District (BAAQMD) Method ST-1B,
 - i. HHV - ASTM Method D 2015 or E 711.

29. A relative accuracy test audit (RATA) must be conducted at least once every four calendar quarters, except as provided in Procedure 1, section 5.1.4. The RATA shall be conducted in accordance with the test procedure in the applicable performance specification. [40 CFR 60, Appendix F, Procedure 1, 5.1.1]
30. The District must be notified prior to any compliance source test, and a source test plan must be submitted for approval 30 days prior to testing. The results of the source test shall be submitted to the District within 60 days of the test date. [District Rule 3.4]
31. The span value for the continuous monitoring system for measuring opacity shall be between 60 and 80 percent. [40 CFR 60.48b(e)]
32. The span value for the continuous monitoring system for measuring nitrogen oxides shall be between 1.5 times the applicable emission standard level and the span value given in the applicable regulation (500 ppm). [40 CFR 60, Appendix B, Section 6.1.1.2 and 40 CFR 60.48b(e)(2)]
33. When nitrogen oxides emissions data are not obtained because of continuous monitoring system breakdowns, repairs, calibration checks and zero and span adjustments, emission data will be obtained by using standby monitoring systems, Method 7, Method 7A, or other approved reference methods to provide emission data for a minimum of 75 percent of the operating hours in each steam generating unit operating day, in at least 22 out of 30 successive steam generating unit operating days. [40 CFR 60.48b(f)]
34. The owner/operator of the facility shall record and maintain records of the amounts of each fuel combusted during each day and calculate the annual capacity factor individually for natural gas and wood for the reporting period. The annual capacity factor is determined on a 12-month rolling average basis with a new annual capacity factor calculated at the end of each calendar month. [40 CFR 60.49b(d)]
35. The Permit Holder shall maintain records of the following information for each day the boiler is operated. The records shall be updated monthly and submitted to the District for each calendar year within 60 days of the end of the calendar year.
 - a. Calendar date;
 - b. The average daily nitrogen oxides (expressed as NO₂) and CO emission rates (lb/hour) measured;
 - c. The 30-day average nitrogen oxides emission rates (lb/hour) calculated at the end of each boiler operating day from the measured hourly nitrogen oxide emission rates for the preceding 30 boiler operating days;
 - d. Identification of the boiler operating days when the calculated 30-day average nitrogen oxides emission rates are in excess of the nitrogen oxide emission limitations of this permit, with the reasons for such excess emissions as well as a description of corrective actions taken;
 - e. Identification of the boiler operating days for which pollutant data have not been obtained, including reasons for not obtaining sufficient data and a description of corrective actions taken;
 - f. Identification of the times when emission data have been excluded from the calculation of average emission rates and the reasons for excluding data;
 - g. Identification of "F" factor used for calculations, method of determination, and type of fuel combusted;

- h. Identification of the times when the pollutant concentration exceeded full span of the CEMS;
 - i. Description of any modifications to the CEMS that could affect the ability of the CEMS to comply with 40 CFR Part 60 Appendix B, PERFORMANCE SPECIFICATIONS 2 or 3;
 - j. Results of daily CEMS drift tests and quarterly accuracy assessments as required under 40 CFR Part 60 appendix F, Procedure 1;
 - k. Time and duration of boiler start-up and shutdown events; and
 - l. Time and duration of equipment and/or control equipment malfunction. [40 CFR Part 60.7(b), 60.49 and District Rule 3.4]
36. The Permit Holder shall submit to the District a written report for each calendar quarter, within 30 days of the end of the calendar quarter, which includes the following:
- a. The date, time intervals, and magnitude of excess permitted emissions or exceedance in opacity computed in accordance with 40 CFR Part 60.13(h);
 - b. The date, time intervals, and operating parameters of the baghouse when operating outside the indicated permitted limits;
 - c. The nature and cause of the excess emissions, exceedance in opacity or control equipment operation deviation, and corrective actions taken;
 - d. The time and date of each period during which the continuous monitoring equipment was inoperative, except for zero and span checks, and the nature of system repairs and adjustments; and
 - e. A negative declaration when no excess emissions, exceedance in opacity or control equipment operation deviation occurred, if applicable. [40 CFR Part 60.7(c), 40 CFR Part 60.49b(h) and District Rule 3.4]
37. The permit holder shall maintain a daily log of all biomass received by type, origin, certified weight, and date. Records shall include certifications that any creditable biomass has historically been openly burned in the Sacramento air basin. [District Rule 3.5, Section 501].
38. The permit holder shall maintain the following records [District Rule 3.4]:
- a. daily, quarterly, and annual hours of operation,
 - b. the date and time of each occurrence, duration, and type of any start-up or shut-down event,
 - c. emission measurements from all source testing and fuel analyses,
 - d. equipment breakdowns or malfunctions,
 - e. daily, quarterly, and annual records of the measured cumulative CO, NO_x, and SO_x mass emissions,
 - f. daily, quarterly, and annual records of the calculated (using the measured steam per period and the emission concentration from the previous source test) cumulative VOC, and PM₁₀ mass emissions,
 - g. any emissions in excess of the PERMITTED EMISSION LIMITS section as recorded by the CEM or source test data,
 - h. all records from the CEMS, including performance testing, evaluations, calibrations, checks, maintenance, adjustments, and any period of non-operation of any CEM.
39. All records shall be kept for a minimum of five years and made available to the District upon request. [District Rule 3.4]

40. Mass emissions in excess of the daily PERMITTED EMISSION LIMITS shall be reported to the District within 96 hours after such occurrence. Such violations shall be subject to the appropriate enforcement action. [District Rule 3.1, Section 405.4]

This permit does not authorize the emission of air contaminants in excess of those allowed by Division 26, Part 4, Chapter 3, of the Health & Safety Codes of the State of California or the Rules and Regulations of the Yolo-Solano Air Quality Management District.

Mat Ehrhardt, P.E.
AIR POLLUTION CONTROL OFFICER

By: _____

Date of Issuance: _____